

Genetic Disorders

5E Lesson

The 5E model is a scientifically proven method to improve student engagement and learning in your classroom

- ✓ Engagement
- ✓ Exploration
- ✓ Explanation
- ✓ Elaborate
- ✓ Evaluate



Complete Teacher Instructions

Genetic Disorders 5E Lesson

Grades 7-10	Genetic Disorders	Ongoing L
Lesson Objective: Students will learn about: - Chromosomal Abnormalities - Trisomy - Mutations - Genetic Disorders - Down Syndrome - Klinefelter Syndrome - Turner Syndrome - Cri-du-Chat Syndrome - Williams Syndrome - Cystic Fibrosis - Huntington Disease - Sickle C - Tay-Sac - Phenylk - Alzheim - Achondr - Autosomal Rec - Gene Editing - Genome Sequ - Julia Bell		
Possible Student Misconceptions: - All mutations are bad - All mutations are inherited - Once a mutation is discovered, it can be fixed - Only certain people have "disease genes" - All disorders present at birth have a genetic basis and are inherited - Chromosomal disorders are all inherited		
Materials: 1 device (smartphone, Chromebook, laptop, tablet, or computer) p - A means of projecting a PowerPoint presentation - Internet access - General classroom objects		
Teacher Notes: - All videos can be accessed directly from the PowerPoint. To retrieve icon while in slideshow mode and it will automatically open for you reason, right-click on the image and click Edit Hyperlink or somet - I've created a video walkthrough if needed. It can be accessed here https://youtu.be/oCIKIP9SaDQ - I don't believe in long lessons. If you feel your students are losing Stop the PowerPoint and give them a 5-minute break. If you'd like recommend my video collection here - http://www.teachwithfergy.com - There are tons of brain-break videos to choose from all grouped b		

Genetic Disorders – 5E Lesson

Engagement Phase

Your students will watch the video 'Autosomal Recessive Inheritance' and complete the questions found in the file – *Engagement – Autosomal Recessive Inheritance*.

The video can be found here -

<https://www.youtube.com/watch?v=Nv6qUsKYodA>

Teacher Notes:

- The video is about three minutes long.
- You may need to pause a few times so students can write down their answers.

Exploration Phase

Exploration – Lab Station Activity

- In groups of 2-3, have your students complete *Exploration – Lab Station Activity*. Once they're done, they will submit their passport to you.

Teacher Notes:

- The complete instructions for my Lab Station activity can be found in the *START HERE – Instructions* file.

Explanation Phase

PowerPoint Lesson

- The lesson is found in the folder – *Explanation – Lesson*
- This lesson is designed to be completed over two days
- There are multiple embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson
- The lesson covers the following topics:
 - Chromosomal Abnormalities
 - Trisomy Syndromes
 - Down Syndrome
 - Klinefelter Syndrome
 - Turner Syndrome
 - Cri-du-Chat Syndrome
 - Williams Syndrome
 - Mutations
 - Cystic Fibrosis
 - Huntington Disease
 - Sickle Cell Disease
 - Tay-Sachs Disease
 - Phenylketonuria
 - Alzheimer Disease

Teacher Notes:

Duration: 20

Teacher Role
learning and
understanding

G

- ☐ Connect st
- ☐ experience
- ☐ Create inte
- ☐ Ask questi
- ☐ Understand objectives

Duration: 1

Teacher Role
learning and
understanding

G

- ☐ Students r
- ☐ experience
- ☐ Students u
- ☐ develop cr
- ☐ skills
- ☐ Students r
- ☐ observatio
- ☐ results, an
- ☐ connectio

Duration: 2

Teacher Role
concepts by
material foun
presentation.

G

- ☐ Students c
- ☐ understand
- ☐ content
- ☐ Observatio
- ☐ experience
- ☐ discussed
- ☐ Students c
- ☐ vocabulary
- ☐ Students a
- ☐ connect th
- ☐ presented
- ☐ experience

- All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-click the image and select **Edit Hyperlink** or something similar.
- I've created a video walkthrough if needed. It can be accessed here - <https://youtu.be/oCIKIP9SaDQ>
- I have also enclosed a .PDF version of both the teacher and student versions.
- I have created two versions of the lesson: one for upper middle school to high school students, and a simpler version for middle schoolers or older students with lower developed learning levels. Choose the version you think best fits your students.

Elaborate Phase

Elaborate – Scavenger Hunt

Your students will complete – *Elaborate – Scavenger Hunt*. This activity will require your students to move beyond what was covered directly in the lesson and allow them to further develop their understanding.

Teacher Notes:

- Students will work individually or in small groups
- Students will need one device per group

Evaluate Phase

Quiz

Have your students complete – *Evaluate – Genetic Disorders Quiz*

Teacher Notes:

- It's sometimes best to have the students peer evaluate
- Placing students in small groups and having them exchange papers to mark will accomplish two things
- Provide immediate feedback on the questions they just completed
- Significantly reduce your marking time
- Peer evaluation is not needed, only suggested when appropriate

Duration: 1 hour

Teacher Role – Facilitate learning and keep students focused

Goal

- ☐ Students use their newly obtained knowledge to propose solutions and extend their learning to new situations

Duration: 30 min

Teacher Role – Distribute and collect evaluation

Goal

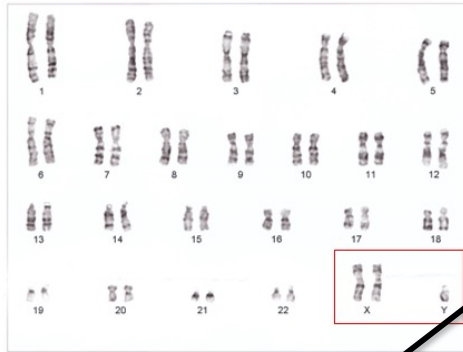
- ☐ Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

A Complete Lesson

Klinefelter Syndrome (47, XXY)

- What is it?
 - Aneuploidy.
 - Two X chromosomes and one Y chromosome.
 - Usually caused by nondisjunction.

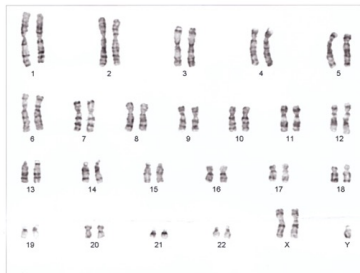


← Make sure your students are on track

Student copies with blanks
Videos embedded right into
your slideshow

Klinefelter Syndrome (47, XXY)

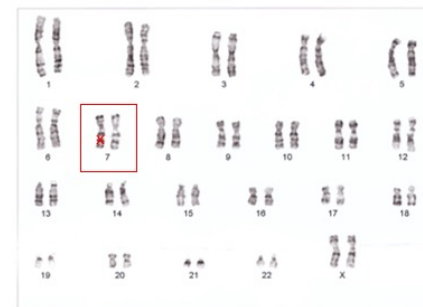
- What is it?
 - _____
 - _____
 - _____



Williams Syndrome



- What is it?
 - Deletion.
 - Missing genes on chromosome 7, including elastin
 - Elastin ensures blood vessels are strong enough and stretchy enough to last a lifetime



Interactive and Engaging Activities

Device-Based Scavenger Hunt Genetic Disorders



Includes

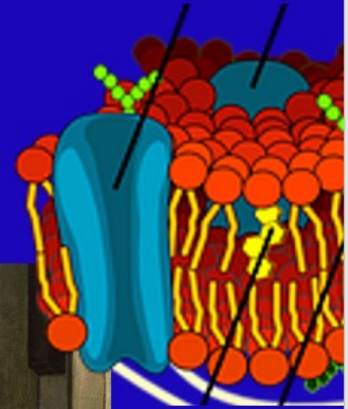
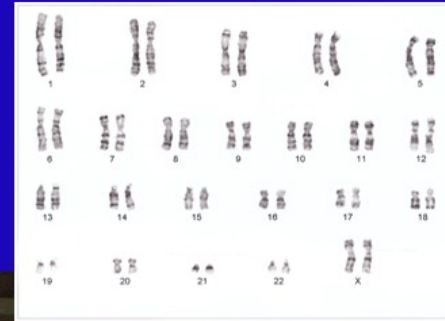
- 5 Unique Locations
- Online form submission
- Answer Key

Works on all smartphones, tablets, Chromebooks, and laptops

- **100% Digital**
- Simulations
- Quizzes
- Videos
- Games
- and more



Genetic Disorders Lab Station Activity



7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

